

Appellants' Reply Brief on Appeal
S/N: 10/671,938

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of

Chen, et al.

Serial No.:	10/671,938	Group Art Unit:	2161
Filed:	September 29, 2003	Examiner:	Kim, P.
For:	SYSTEM AND METHOD FOR MONITORING EVENTS AGAINST CONTINUAL RANGE QUERIES		

Commissioner for Patents
Alexandria, VA 22313-1450

APPELLANTS' REPLY BRIEF ON APPEAL

Sir:

Appellants respectfully respond to the Examiner's Answer mailed on August 6, 2007. The response herein intentionally does not follow the headings of the Appeal Brief and avoids repetition of Appellants' former arguments, in order to focus specifically on additional points raised by the Examiner's Answer. This Reply Brief uses the headings in the Examiner's Answer, for convenience of correlation with the Answer.

1. Summary of Claimed Subject Matter

In Section (5) on page 2 of the Answer, the Examiner correctly notes that Appellants' Brief inadvertently failed to identify location in the specification for the final two claim limitations for claim 9.

In response, Appellants note that these features are described at lines 9-11 of page 7 and line 9 of page 16 through line 14 on page 17. Attached to this Reply Brief is the entire section that includes all claims, including an update for claim 9.

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2. The Rejections under 35 U.S.C. §101

In Section (3) on page 4 of the Answer, the Examiner indicates: "The rejections of claims 1-20 under 35 U.S.C. 101 for failing to provide a tangible result are withdrawn."

In Section (5) on page 4 of the Answer, the Examiner indicates: "While claim 5 is not rejected on prior art, it is also not indicated as containing allowable subject matter until such time as the rejections under 35 U.S.C. 101 are overcome."

In Section (10) beginning on page 8 of the Answer, the Examiner seems to proceed in the discussion as if all claims are rejected under 35 U.S.C. §101.

In responding to the Answer, Appellants are uncertain whether claims 1-20 are considered rejected under 35 U.S.C. §101, since the Answer suggests both that rejection is maintained and that at least part of the rejection has been withdrawn. However, following a telephone interview with SPE Mofiz today, October 9, 2007, attempting clarification for purpose of this Reply, Appellants conservatively presume for sake of this Reply Brief that the statutory subject matter is maintained for all claims.

3. Section (10) Response to Arguments (beginning on page 8 of Examiner's Answer)

The remainder of this Reply Brief responds to points of the Examiner's Response to Arguments, using the subheadings used by the Examiner

Ground 1: The Rejection of Claims 1-20 under 35 U.S.C. 101

In response to the Examiner's arguments in Section 10(a), Appellants fail to even understand the Examiner's point, since the claimed invention, as explained in the Appeal Brief, is directed to activity/event monitoring, which inherently constitutes a practical, real-world application, rather than an idea in the abstract. Moreover, the present invention is clearly executed on a computer.

Appellants fail to understand the Examiner's traversal, since, even if the method is executed by software modules, as alleged by the Examiner, it is still directed toward activity/event monitoring, which Appellants submit to be inherently statutory subject matter. As best can be deciphered from the Examiner's statements of record, the Docket YOR920030165US1 (YOR.460)

Examiner considers that statutory subject matter is a question of claim wording rather than the subject matter itself. Appellants respectfully submit that the Examiner's position is erroneous, since statutory subject matter relates to the threshold question of the subject matter itself, not to claim wording of that subject matter.

Appellants submit that *State Street* and *AT&T* clearly held that computerized methods are statutory subject matter if the claimed invention as a whole provides a useful, concrete and tangible result. Appellants submit that such result is inherent in an activity/event monitoring method/system such as described in the present invention.

Relative to the Examiner's allegation that certain claims, for example, claim 1, recite nothing more than non-functional descriptive material, Appellants respectfully point out that claim 1 recites the steps of monitoring continual range queries against events by decomposing a range query, building a query index, and matching events using the query index.

In order to execute these steps, Appellants respectfully submit that the computer must receive data related to the events, as well as the range query from the user. In order to decompose the range query and build the query index, the computer must execute steps that can be measured by one having ordinary skill in the art at any one of the computer instructions involved in executing these steps.

Therefore, Appellants submit that claim 1 has nothing whatsoever to do with non-functional descriptive material.

Relative to the Examiner's allegation that claims 1-8 and 10-20 "... fail to recite a use of said match", Appellants again respectfully submit that a "useful result" is inherent in the result of an activity/event monitoring process, by reason of detecting whether the activity or event has occurred.

As best understood, the Examiner considers that no useful result occurs unless an output is identified in the claims. In response, to the extent that the Examiner's point has merit, Appellants point out that claims 9 (final limitation), 10 (final limitation), 11, 13, and 14 (final limitation) all provide description of an output.

However, Appellants also submit that case law has repeatedly established that statutory subject matter is not resolved by merely adding an arbitrary description of
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outputting the result of the process. For example, as repeated in AT&T (172 F.3d 1352; 1999 U.S. App. LEXIS 7221; 50 U.S.P.Q. 2D (BNA) 1447, referring to wording from Arrhythmia, 958 F.2d 1053, 22 U.S.P.Q 2D (BNA) 1033 (Fed. Cir. 1992)): *"The finding that the claimed process "transformed" data from one "form" to another simply confirmed that Arrhythmia's method claims satisfied §101 because the mathematical algorithm included within the process was applied to produce a number which had a specific meaning – a useful, concrete, and tangible result – not a mathematical abstraction."*

Similarly, although the present invention clearly includes mathematical processing, Appellants respectfully submit that the result of identifying whether an event associated with an input query has occurred inherently provides the prerequisite "useful, concrete, and tangible result" necessary for the statutory subject matter threshold.

Ground 2: The Rejection of Claims 16-19 under 35 U.S.C. 101

Appellants have nothing more to add to their arguments in the Appeal Brief.

Ground 3: The Rejection of Claim 20 under 35 U.S.C. 112

On page 10 of the Answer, the Examiner states: *"It is noted that a rectangle may "become progressively smaller in size," either in its overall perimeter or area. Hence, the phrase "progressively smaller" is unclear because the reducing of a rectangle's perimeter does not necessitate a reduction in the rectangle's area.... Therefore, while Appellant claims that the use of the phrase "progressively smaller in size" would present no confusion to one having ordinary skill in the art, the Examiner notes that it is imperative that Appellant further clarify how the rectangle is reduced in size since a reduction in the perimeter of a rectangle would not necessarily mean that the area of the rectangle would have been similarly reduced."*

In response, Appellants respectfully submit that the above explanation by the Examiner indicates confusion between indefiniteness versus over-breadth and that this rejection is improper, since allegedly being overly-broad is not indefiniteness.

That is, the Examiner concedes that a rectangle becomes progressively smaller either in its overall perimeter or in area. Therefore, Appellants submit that, under the Examiner's interpretation, the claim simply covers both manners of becoming progressively.

In response to the Examiner's position that "... *it is imperative that Appellant further clarify how the rectangle is reduced in size since a reduction in the perimeter of a rectangle would not necessarily mean that the area of the rectangle would have been similarly reduced*", Appellants respectfully disagree that there is any need to further limit this claim description if the Examiner concedes that either manner will reduce the size. Indeed, Appellants respectfully submit that further limitation would be required only if the Examiner makes of record an appropriate prior art reference demonstrating that one manner or the other is obvious.

Appellants respectfully submit that the underlying flaw of the Examiner's position relative to the final sentence recited above is that the language of the claim does not recite "area", so that it is irrelevant that "... *would not necessarily mean that the area of the rectangle would have been similarly reduced.*" That is, although the Examiner's observation may be correct, such observation is not significant in the interpretation of the claim language.

Ground 4: The Rejection of Claim 9 under 35 U.S.C. 102(b), as based on Liu

In response to the Examiner's explanation on page 11 of the construction of the language of claim 9, Appellants bring to the Board's attention that even this explanation simply ignores the claim language. Thus, for example, contrary to the Examiner's characterization, the second limitation of claim 9 does not recite: "maintaining one or more customer interests."

Rather, the second limitation recites: "maintaining one or more customer interests expressed as continual range queries for the service that monitors events."

Similarly, the first limitation does not recite "providing a service that monitors events", and the third limitation does not recite "notifying a subset of customers."

Therefore, Appellants respectfully submit that the rejection is improper because it ignores selected claim wording, thereby ignoring the plain meaning of the claim language.

Ground 5: The Rejection of Claims 1-4, 6, 7, and 10-15 under 35 U.S.C. 103(a), as based on Liu, in View of Burrows

i. Liu Differs Fundamentally from the Present Invention in Principle of Operation

(1) Relative to the final sentence wherein the Examiner alleges that claims 1, 10, and 15 “... *fail to recite another method step that identifies additional queries defining an event which has already been discovered* ...”, Appellants submit that such recitation is not required to distinguish from Liu/Burrows since an index method relating back to input queries is not used in either of these two references.

The index of secondary reference Burrows is used to divide the database contents so it is more easily searched, a concept entirely different from an index that relates a detected event back to queries searching for that event. Burrows does not even have “events” that are being monitored, let alone an index that relates back to allow the interested query to be identified when an event is detected as having occurred.

Moreover, Appellants submit that the rejection of record fails to establish a *prima facie* rejection by reason of the failure to demonstrate such indexing mechanism.

(2) Relative to the final sentence wherein the Examiner alleges that claims 1, 10, and 15 “... *fail to recite said method as being simultaneously conducted by a monitor*...”, Appellants submit that such recitation is not required to distinguish from Liu/Burrows since an index method relating back to input queries is not used in either of these two references and the capability of the present invention to conduct simultaneous monitoring is not necessary for distinction.

(3) Relative to the penultimate sentence wherein the Examiner alleges that the claims fail to recite the feature “... *using an index to correlate an event detected by one query with an event for another query*...”, Appellants respectfully submit that such capability is inherent in the final limitation of independent claim 1, when properly interpreted in view of the preamble, the disclosure, and the meaning of “query index.”

(4) Relative to the Examiner's reference to the description in Section 2.1 of Liu discussing processing of a continual query results in a sequence of query answers {Q(S1), Q(S2), ... Q(Sn)}, Appellants submit that this description merely states that a query is exercised over the state of the database at discrete intervals over time. It suggests nothing about decomposing an input query into virtual constructs. Nor is there any suggestion in this definition of a continual query of constructing an index relating events back to specific input queries. Indeed, the definition of continual query described in this section of Liu teaches that each query is independently run as the monitoring technique, which technique teaches against the method of the present invention of determining which input queries relate to a detected event. The "decomposing" of the input query in Liu is merely a parsing of the query into components of the query and has no implication or suggestion related to "virtual constructs" such as the rectangles of the present invention.

ii. Burrows is Non-analogous Art to Liu and to the Claimed Invention

Appellants again submit that secondary reference Burrows is not related to an event monitoring system. Rather, Burrows relates merely to constructing an index for a database so that the database can be more efficiently searched in response to an input query. This type of index mechanism is entirely different in concept from that of determining which input queries are associated with an event within an event space and is not even related to determining, given a database item determined to respond to at least one input query, which other input queries are also searching for this same database item. Thus, even if Burrows were to be somehow incorporated into Liu, the result would not be an index relating events to input queries. Rather, incorporation of the index scheme of Burrows into Liu would simply divide the event space to be referenced by an index, which would arguably be an indexing scheme but it is not related to the present invention. Again, this indexing scheme of Burrows does not satisfy the plain meaning of the description of the independent claims.

iii. The Claimed Invention Does Not Result

Appellants submit that the Examiner's reliance on *In re Keller* is misplaced since the facts underlying that holding are not present here. In the present response, Appellants are demonstrating that the Examiner has failed to establish a *prima facie* rejection because of deficiencies in Liu, because Burrows is non-analogous, because the index scheme in secondary reference Burrows would fail to result in the claimed invention even if incorporated into Liu, and because the principle of operation of Liu would improperly be changed thereby.

In contrast, the wording from *Keller* results from a fact pattern in which the Court held that the Examiner had established a *prima facie* rejection for obviousness and the Appellant in that case had failed to provide an adequate rebuttal because the affidavit provided by that Appellant only addressed one of the two references that the Court held to have been properly combined by the Examiner. The reference that was not addressed in that affidavit demonstrated that use of a digital timer instead of an analog timer was known in the art of cardiac pacers.

iv. Lack of Motivation and Hindsight Reasoning

Appellants respectfully submit that *In re McLaughlin* does not overrule the recent holding in *KSR* (127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007)): "... *there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.*" (emphasis by Appellants)

Appellants have provided various reasons why the legal conclusion of obviousness is not rationally supported, including the observation that, even if the two cited references were to be combined, the claimed invention would not result since the index mechanism in Burrows is not directed to determining which input queries are interested in a specific database entry. Neither Burrows nor Liu suggest an index relating back to input queries.

Appellants respectfully submit that *In re McLaughlin* does not suggest that a prior art evaluation is rationally supported simply by finding words in unrelated prior art references that together supposedly interconnect mysteriously to result in a unique combination of elements, if, to one having ordinary skill in the art, these words in the Docket YOR920030165US1 (YOR.460)

context of the prior art references do not describe the same concepts as disclosed or claimed.

v. Liu/Burrows Fail to Satisfy the Plain Meaning

Appellants again point out that “decomposing” in Liu is actually referring to “parsing” the input query into components for the different data sources and has no implication or suggestion of decomposing the query into predefined virtual constructs. Neither Burrows nor Liu uses virtual constructs.

vi. Rejection of Claims 2, 3, 6, and 7

Appellants have no additional comments on the rejection of these claims from those provided in their Appeal Brief.

CONCLUSION

In view of the foregoing, Appellants submit that claims 1-20, all the claims presently pending in the application, are clearly enabled and patentably distinct from the prior art of record and in condition for allowance. Thus, the Board is respectfully requested to remove all rejections of claims 1-20.

Please charge any deficiencies and/or credit any overpayments necessary to enter this paper to Assignee's Deposit Account number 50-0510.

Respectfully submitted,



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Attachment to Reply Brief

Following is the complete listing of claims for Section V of the Appeal Brief, as updated to include the location in the specification for the final two claim limitations of claim 9 (identified in the Examiner's Answer as deficient):

V. SUMMARY OF CLAIMED SUBJECT MATTER

1. (Rejected) A method for monitoring continual range queries against events (line 15 of page 1 through line 2 of page 2), said method comprising:
 - decomposing each range query into one or more predefined virtual constructs (step 204 of Fig. 2);
 - building a query index (steps 201, 205 of Fig. 2); and
 - using said query index to match an event with said range queries (step 208 of Fig. 2).
2. (Rejected) The method of claim 1, said building of a query index further comprising:
 - storing an identification of said query with identification lists associated with said virtual constructs (step 205 of Fig. 1).
3. (Rejected) The method of claim 1, said building of a query index further comprising:
 - predefining a set of virtual constructs for each point being monitored (step 202 of Fig. 1; lines 19-21 of page 13).
4. (Rejected) The method of claim 1, said matching of an event with said range queries further comprising:
 - finding all the virtual constructs that cover said event (step 207 of Fig. 1; lines 16-18 of page 13).
5. (Rejected) The method of claim 1, said decomposing of a range query further comprising:
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initializing a working rectangle to be said range query (e.g., see VCR:8 in right corner of Fig. 3; lines 21-22 of page 3; step 604 of Fig. 6; line 22 of page 12 through line 2 of page 13);

repeatedly cutting a strip rectangle from said working rectangle (e.g., see VCR:5 and VCR:2 on right side of Fig. 3; step 607 of Fig. 6; lines 6-7 of page 13); and

decomposing said strip rectangle with one or more of said virtual constructs (e.g., see VCR:0, VCR:1, VCR:3, VCR:4, VCR:6, and VCR:7 in Fig. 3; lines 22-24 of page 8).

6. (Rejected) The method of claim 4, wherein a size of the set of covering virtual constructs of an event is constant for all the event points (lines 6-7 of page 14).

7. (Rejected) The method of claim 4, wherein gaps between corresponding different covering virtual constructs of all event points are identical (lines 6-7 of page 14).

8. (Rejected) The method of claim 4, said finding of all covering virtual constructs of an event comprising:

pre-computing of a difference table (line 1 of page 15);

computing an identification of a pivot virtual construct (line 2 of page 15); and

adding said identification of pivot virtual construct to each of the elements stored in said difference table (step 804 of Fig. 8; lines 10-12 of page 15).

9. (Rejected) A method of providing a service of monitoring events or conditions (line 9 of page 16 through line 14 of page 17), said method comprising at least one of the following:

providing a service that monitors events against interests of a customer, said service monitoring said events by decomposing continual range queries related to said customer interests with one or predefined virtual constructs, building a query index, and using said query index to match an event with said range queries (see Fig. 2);

maintaining one or more customer interests expressed as continual range queries for the service that monitors events (lines 9-11 of page 7; and line 9 of page 16 through line 14 of page 17); and

notifying a subset of said customers whose interests match an event (lines 9-11 of page 7; and line 9 of page 16 through line 14 of page 17).

10. (Rejected) A system (e.g., see Fig. 1) for monitoring continual range queries against events, said system comprising:

a decomposing module that decomposes each range query into one or more predefined virtual constructs (e.g., step 204 of Fig. 2);

a query index construction module (e.g., steps 201, 205 of Fig. 2); and

an event matching module that uses said query index to match an event with said range queries (e.g., step 208 of Fig. 2).

11. (Rejected) The system of claim 10, further comprising:

at least one sensor (101, 102 of Fig. 1) to detect occurrence of events.

12. (Rejected) The system of claim 10, further comprising:

at least one client input station (111, 112 of Fig. 1; line 7 of page 7) to permit a client to provide an input query.

13. (Rejected) The system of claim 10, further comprising:

at least one client receiver (111, 112 of Fig. 1; line 7 of page 7) to permit a client to be notified of occurrence of an event of interest.

14. (Rejected) An apparatus for monitoring continual range queries against events, said apparatus comprising one of:

a query monitor that includes:

a decomposing module that decomposes each range query into one or more predefined virtual constructs (e.g., see step 204 of Fig. 2);

a query index construction module (e.g., see steps 201, 205 of Fig. 2); and
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an event matching module that uses said query index to match an event with said range queries (e.g., see step 208 of Fig. 2);

a sensor (101, 102 of Fig. 1; lines 4-5 of page 7) to detect occurrence of events and provides said occurrence of events into said query monitor;

a client receiver (111, 112 of Fig. 1; line 7 of page 7) to permit a client to be notified of occurrence of an event of interest to said client.

15. (Rejected) A signal-bearing medium (e.g., 1000 of Fig. 10) tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method for monitoring continual range queries against events, said method comprising:

decomposing each range query into one or more predefined virtual constructs (e.g., step 204 of Fig. 2);

building a query index (e.g., step 201 of Fig. 2); and

using said query index to match an event with said range queries (e.g., step 208 of Fig. 2).

16. (Rejected) The method of claim 1, wherein said event is monitored by scanning points in an event space having at least one dimension (see monitoring area 400 of Fig. 4; line 16 of page 10), and said predefined virtual constructs comprise rectangular objects in said event space (e.g., 401 of Fig. 4; lines 14-15 of page 10).

17. (Rejected) The method of claim 16, wherein dimensional ratios of said predefined virtual constructs are based on powers of 2 relative to a dimension of said event space (line 23 of page 9).

18. (Rejected) The method of claim 1, wherein each said predefined virtual construct is identified as based on a location of a corner of said virtual construct in a monitored region of said event space and at least one dimension of said virtual construct (lines 10-13 of page 8, line 4 of page 10 through line 21 of page 11).
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19. (Rejected) The method of claim 18, wherein an identification of each said predefined virtual construct is calculated to be an integer, the calculations for said integer being based at least in part on said location and said at least one dimension (lines 13-15 of page 8; line 4 of page 10 through line 21 of page 11).

20. (Rejected) The method of claim 1, wherein said decomposing each range to determine said one or more predefined virtual constructs comprises generating a set of working rectangles in an event space that become progressively smaller in size (e.g., see Fig. 3; lines 5-7 of page 12).